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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,217	06/24/2003	Geoff W. Taylor	OPE-024	2252
36822	7590	12/22/2004		
GORDON & JACOBSON, P.C. 65 WOODS END ROAD STAMFORD, CT 06905			EXAMINER PAK, SUNG H	
			ART UNIT 2874	PAPER NUMBER

DATE MAILED: 12/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/602,217		TAYLOR ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Sung H. Pak		2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 September 2004.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 1-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 33-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>0404, 0904</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

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## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of group IV, claims 33-40 in the reply filed on 9/23/2004 is acknowledged.

### ***Information Disclosure Statement***

Information disclosure statements filed 4/26/2004 and 9/23/2004 have been considered by the examiner.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 33, 34, 37-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yap et al (US 6,781,533).

Yap discloses a sigma delta analog to digital converter (ADC) comprising: an integrating stage comprising a resistor, gain amplifier, a feedback capacitor (Fig. 5, Fig. 6A, column 3 lines 23-41); a device for performing analog to digital conversion and electrical to optical conversion of the result of the analog to digital conversion (Fig. 5); a device for performing digital to analog conversion (Fig. 5); a decimation filter operably coupled (Fig. 5); sigma delta converter formed from a quantum well channel device structure (Fig. 6c, column 8 lines 1-25).

However, Yap does not explicitly state the use of heterojunction thyristor devices. Nevertheless the use of thyristor devices as electro-optic components are well known and common in the art. Thyristors are advantageously used to provide reliable, precisely controlled electro optic component with high accuracy. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yap device to use thyristor devices.

Claim 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yap et al (US 6,781,533) in view of Hellberg (US 6,094,458).

Yap discloses a sigma delta converter with all the limitations set forth in the claims as discussed above, except it does not explicitly teach the use of a third device that operate in response to a sampling clock signal supplied to synchronize electro optic converter.

Hellberg, on the other hand, explicitly teaches the use of a third device that operate in response to a sampling clock signal supplied to perform synchronization (Fig. 5, Fig. 6, Fig. 8).

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Such a device is advantageous and desirable because it enhances the efficiency of the sigma delta converter. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yap device to have a device that operate in response to a sampling clock signal to perform synchronization.

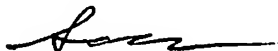
### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tiemann (US 5,565,867) discloses an analog to digital converter with optical links.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sung H. Pak  
Examiner  
Art Unit 2874

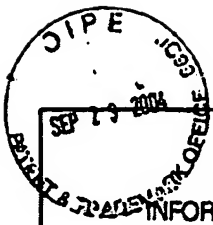
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DATE CONSIDERED



INFORMATION DISCLOSURE CITATION  PAGE 2 OF 2		Atty Docket No. OPE-024	Serial No. 10/602,217
		Applicant Geoff W. Taylor et al.	
		Filed June 24, 2003	Group 2874
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
SP		"A Brief Introduction to Sigma Delta Conversion", by David Jarman; Intersil publication; May, 1995	
SP		"High Resolution Signal Conditioning ADCs" by Walt Kester, James Bryant, and Joe Buxton;	
SP		"Synthesis and Analysis of Sigma-Delta Modulators Employing Continuous-Time Filters", by Philippe Benabes, Mansour Keramat, and Richard Kielbasa; Analog Integrated Circuits and Signal Processing	
SP		"Analog-to-Digital Converter Architectures and Choices for System Design"; by Brian Black; Analog Dialogue 33-8 (1999)	
SP		"Polymer-Based Optical Waveguides for Photonic Phased Array Antennas"; by Suning Tang, L. Wu, Z. Fu, D. An, Z. Han, and Ray T. Chen; January, 1999; Part of the SPIE Conference on Optoelectronic Interconnects VI	
EXAMINER		DATE CONSIDERED	
Sung Pak		12/9/04	